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Response to Comments
Draft Treatability Studies Report
Operable Unit 16, Site 89
MCB Camp Lejeune, North Carolina

Introduction

The purpose of this document is to address comments on the Draft Treatability Studies Report for Operable Unit 16, Site 89. The North Carolina Department of Environment and Natural Resources (NCDENR) provided the comments listed. The responses to comments are provided in bold. United States Environmental Protection Agency (USEPA) had no comments.

North Carolina Department of Environment and Natural Resources Comments (dated December 13, 2007)

General Comment

1. It is recommended that at least one additional six month monitoring event be completed in the ZVI treatment zone. The ORP in this area dropped significantly during the ZVI study. This may be a good indicator to help make a decision as to whether additional sampling should be completed. If the ORP remains low at the time of sampling in this area, it would indicate that aquifer conditions are good for chemical reduction. This information may not affect the decision process for Site 89 but may help the partnering team make future decisions regarding the use of ZVI at other sites on Base.

   Comment noted. The scope of the project, as described in the Work Plan, is complete. No additional samples will be collected, as discussed in the February 2008 Partnering Meeting.

Specific Comments

1. The "Air Sparing with HDD" heading located on pages ES-2 and 1-2 has a typographical error. Please change sparing to Sparging.

   The headings will be revised.

2. The horizontal well Air Sparging system monitoring wells are not well located (See Figures 1-8 and 2-2) for proper confirmation on the east side of the plume. MW-49 wells are the only monitoring wells located 30-35 feet from the HDD Sparge Well. This appears to be an oversight in the Work Plan for this Treatability Study. The MW-43 and MW-48 monitoring well clusters are the only wells at the proper distance to evaluate the extent of the radius of influence. No other wells except MW-32 are at extended distances to confirm the extent of the radius of influence. If the partnering team chooses this technology for full-scale

implementation it would be appropriate to install a few permanent monitoring wells on either side of the HDD sparge well and then include several additional temporary monitoring wells to get better coverage at the extent of the radius of influence. Another alternative would be to use DPT technology to collect groundwater samples along the interstitial areas between HDD sparge wells. This would provide more information along the full length of the HDD sparge wells assuring that heterogeneous aquifer conditions have not limited the effectiveness of the sparging system in large areas of the site.

Comment noted. During design of the air sparging system, the radius of influence was assumed to be a V-shape, with equal influence on either side, with an anticipated 30-foot treatment width at the target depth. Monitoring well clusters MW-43, MW-48, and MW-49 were installed within 60 feet of the well to evaluate the radius of influence during the study.

3. As noted in the fourth paragraph on page 5-3 and by observing Figures 5-9 through 5-11, it is clear that the indoor soil gas concentrations are extreme (100s to greater than 8000 ppbv) for TCE. These concentrations though they may not exceed the estimated indoor air concentrations for chronic health risk action are considerably high. If Air Sparging technology is chosen for full-scale implementation at Site 89, air monitoring in the area should be completed during the first month of sparging and soil gas or indoor air monitoring should be completed periodically throughout the sparging process. We would expect lower concentrations near building TC860 and TC864 since the soil and groundwater concentrations have decreased significantly as a result of the Treatability Study/Pilot Study treatment in this area.

   Agreed. If air sparging is selected for full-scale implementation, soil gas monitoring and/or installation of a vapor collection system will be considered or included in final design and implementation. However, it should be noted that soil gas, not indoor air, was monitored during this study.

4. The effectiveness section of Table 7-1 for Air Sparging should also note that rebound may occur but the sparge system could be restarted for a lower cost to further treat newly dissolved contaminants.

   Enhanced Reductive Dechlorination of high concentrations of contaminant as discussed in Table 7-1 will almost certainly require multiple injections over a period of time due to some rebound. Please include this information in Table 7-1.

   Table 7-1 will be revised.

5. The conclusion of section 6 in Appendix F by ARS Technology is inconsistent with the statements and conclusions in the body of the Draft Treatability Study Report and Table 2-1. ARS concludes based on data parameters including pressure curves during pneumatic fracturing that fracturing of soils occurred. This would also include some dispersion of the ZVI into the surrounding aquifer. It may be that the ZVI did not work due to complete geochemistry rather than little or no ZVI distribution in the aquifer. Chemical reduction is a slow process and may just need more time to show positive results.

Appendix F is the implementation summary of pneumatic fracturing associated with the Air Sparge Treatability Study, which does indicate that fracturing was achieved. Appendix D is the implementation summary of pneumatic fracturing associated with the Ferox study, which indicates that fracturing was not successful in this area; therefore, ZVI distribution was limited.